GAME-BASED LEARNING COURSEWARE FOR PRE-SCHOOL CHILDREN FOR HEALTHY EATING

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GAME-BASED LEARNING COURSEWARE FOR PRE-SCHOOL CHILDREN FOR HEALTHY EATING

A project submitted to the School of Computing in partial fulfillment of the requirement for the degree Master of Science (Information Technology) Universiti Utara Malaysia

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ABSTRACT

Game Based Learning (GBL) is still one of the most effective teaching strategies to enhance learning. Overweight and obesity are considered as dangerous problem around the world. Moreover, they have a direct relation with many health problems and diseases. This project helps to improve information through a project about overweight and obesity among pre-school children in UUM kindergarten. The project will propose a courseware Happy Healthy Meal (HHM) prototype for healthy eating. Each child can interact with a game to realize which are health and unhealthy food. This project focuses on pre-school in UUM kindergarten. The study will adopt the Vaishnavi & Kuechler methodology and ADDIE model to develop the prototype.

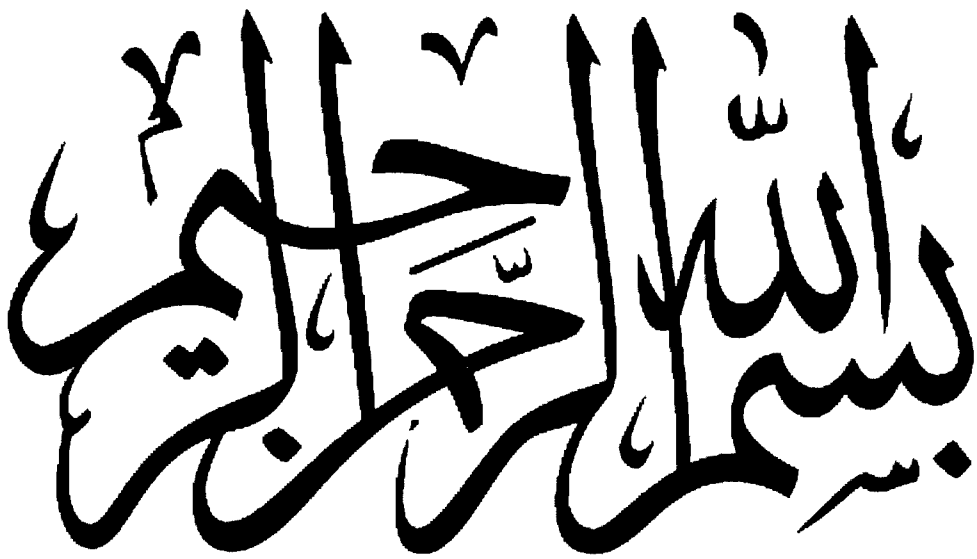
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TABLE OF CONTENTS

CHAPTER THREE: RESEARCH METHODOLOGY

CHAPTER FOUR: SYSTEM ANALYSIS AND DESIGN

LIST OF FIGURES

LIST OF TABLE

LIST OF APPENDICES

LIST OF ABBREVIATION

1. GBL: Game Based Learning.
2. HHM: Happy Healthy Meal.
3. ADDIE: the Analysis, Design, Development, Implementation, and Evaluation

CHAPTER ONE

INTRODUCTION

This chapter presents the purpose of this project that is a game based learning courseware for pre-school children for healthy eating, with detail of the background, furthermore, discussion about the problem of study, research question, objectives, scope of the project and project significance are also available.

1.1 BACKGROUND

Children and game are always together. Educational games "are games designed with specific curriculum objectives in mind" (Royle, 2008) often games that have been used in education have been developed to support the practice of factual information. Educational game might be the most suitable game for the pre-school children which bring knowledge to the children. Computer-based education games are the combination of education, entertainment and imitate the real-life environment.

Overweight and obesity are becoming public health problems, concerns in many countries in world. With the change in lifestyle are now occurring in the population, not only is the problem growing among adults, but also the problem now seems to be seen in the children population. The shift toward a more sedentary lifestyle and the consumption of calorie-dense diets, coupled with improving economic base and environmental conditions, is apparently contributing to the transition from the

problem of under nutrition to over nutrition in many segments of the population. School-based intervention programs are attractive strategy to prevent the problem from spreading, but again their impact and sustainability remain at issue (Florentino, 2004).

Unhealthy eating behavior can cause obesity disease. This disease can occur both in children and adult. Obesity in children or childhood is an energy imbalance between calories consumed and calories expended. Unhealthy lifestyle during childhood can be causes disability in adulthood and diabetes.

The prevalence of overweight children around the world has increased dramatically in recent years. In 2010 the number of overweight children under the age of five, is estimated to be over 42 million. Close to 35 million of these are living in developing countries (WHO, 2011). WHO recognizes that the increasing prevalence of childhood obesity results from changes in society. Childhood obesity is mainly associated with unhealthy eating and low levels of physical activities.

1.2 PROBLEM STATEMENT

Several reports was shown already a high and increasing rates of overweight and obesity among preschool children living in developing countries (de Onis & Blassner 2000). Children become overweight cause of variety of reasons. The most common causes are unhealthy eating patterns, lack of physical activity, genetic factors, or a combination of these factors. In rare cases, a medical problem, such as an endocrine disorder that may cause a child to become overweight.

Child obesity have problem continues without improve understanding of key factors operative during early childhood and identification of effective interventions. There have been few studies on obesity in Malaysia. A study in 2004 reported a prevalence of overweight of 7.3% in a sample of urban youngsters (Moy *et al.*, 2004).

In order to prevent childhood obesity children must learn to eat well. The children must consume healthy food, especially the pre-school children in the age 4-14 years old they may not know what they should eat or should not because of their in adequate ability has limited and lack of experience (Zhang, 2009).

Game Based Learning (GBL) remains one of the most effective teaching strategies to promote learning. Among all application software and computer games are having a shorter learning curve. If used effectively in a coherent and relevant way, GBL can support both the option of more choice for how the learner can learn as well as offering the potential for personalizing the learning experience (Sugimoto, 2007).

1.3 RESEARCH QUESTION

This study aims to answer the following questions:

i. What are the requirements of game based learning (HHM) courseware?

ii. What is the design for game-based learning (HHM) courseware to educate?

1.4 RESEARCH OBJECTIVE

The main objective is to develop an interactive game based learning courseware to educate children how to eat very well and how to choose healthy foods. To achieve this objective, the following sub-objectives have been identified:

i. To identify requirements for game based learning courseware.

ii. To design and develop the prototype.

iii. To test functionality.

1.5 SCOPE

This GBL product developed for pre-school children in UUM kindergarten. The name of courseware is Happy Healthy Meal (HHM). To teach children what are the healthy foods. The children must learn about nutrition of each food first, before they start the game. Each food will represent nutrition to help student easier to understand. There are six main menus for this courseware.

First menu is the game menu where the children will start to play game here. It will provide instruction how to play before children start to play. the play game has three levels in each level has several stage, in this game player has charterer (boy) that he/she must take care it by fed him healthy food. If the children click on unhealthy food, the character will be getting fat till game is over but if the children on the healthy food, the character will be healthier like red cheek, smiling, jumping. This game has many pictures about healthy food and the charterer has several situations as following:

i. Healthier situation.

ii. Happy situation.

iii. Normal situation.

iv. Overweight situation.

v. Obesity situation.

Second menu is the introducing healthy food that will be used in the game. It will teach children learn about healthy food and nutrition. It will show the image and nutrition of each food in text. After finish all the food introduction, it will back to the main menu. As shown in Figure 1.1.

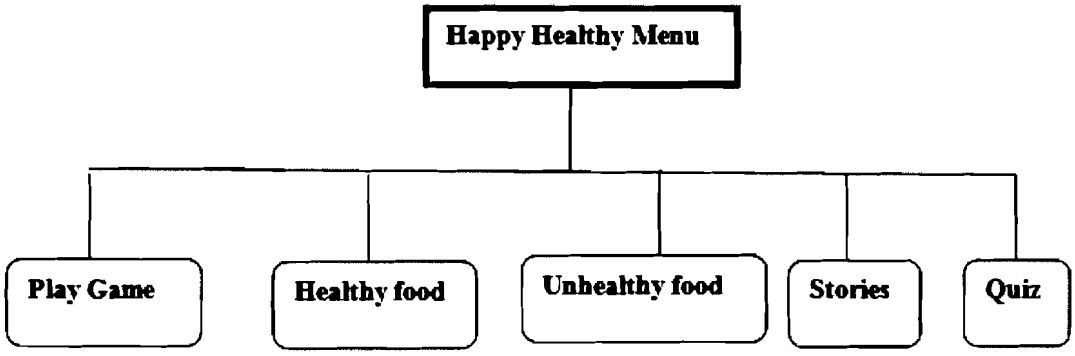


Figure 1.1: main menu

Third menu is the introducing unhealthy food that will be used in the game. It will teach children learn about unhealthy food. It will show the image of each food in text. After finish all the food introduction, it will back to the main menu. The status of character can encourage children learning actively (Zhang, 2009).

1.6 PROJECT SIGNIFICANT

The rise of Computer game-based learning considers one of the most highly subject in educational system nowadays. The last few years, it has been rapidly published in two ways, the potential of computer games as a tool of teaching. It takes a place in influence for both adults and children to develop the fundamental of learning style, consequently; to promote engagement and mastery of tasks development. Games are a main element of developing the experience of human to adapt and learn in different ways, it gives the chance to practice and find out the newly matters in proper way.

Game Based Learning (GBL) is a part of real games that relates with application has elaborated the outcomes of learning. Commonly it designed to meet the main matter with the game and the player to apply the subject in real world. Games usually have some attractive elements to encourage the player in learning activities neither narrative nor storyline. Educational video games it could be a tool to motivate children and help them with a better awareness. They will have the chance to be socially active and learn as individuals. Recreation games are widely used it becomes social, while teens playing games with others they will learn new aspects of life in terms of civilization and political side.

Game Based Learning accomplished strategies to those active participation and interaction as the experience would be the main point, even the recent educational system methods are not enough for the students. The experience of learning games tools become universal in term of higher education.

Programmers of computer educational games have a point that computer games have different methods of learning with the use of technology not as the tradition ways we cloud recognize that the new generation always closes and motivated to the use of technology. So to sum up, children and adult will be more interested and highly motivated with the new technology not like old generation. This study proposes the GBL courseware to educate the children to recognize food that is healthy for them.

1.7 CHAPTERS STRUCTURE

This study is presented in six chapters. An overview of the content of the following chapters is as following

Chapter Two presents a review on the literature of a Game Based Learning (GBL) and previous related works in GBL, courseware, multimedia, edutainment, educational game design and game in health care.

Chapter Three focuses on the methodology that used in implementing this project in order to achieve the study objectives, while chapter four and five highlight the project findings.

Chapter Four discusses the user requirement and design for the courseware GBL prototype. The analysis has been done using a set of questionnaires which consists of descriptive static and reliability analysis.

Chapter Five explained the data analysis of the courseware HHM prototype. The method used for data acquisition and collection in this project is User Interface Satisfaction evaluation (QUIS) a questionnaire.

Chapter Six emphasizes on the project limitations, future recommendations and concludes the findings of this project.

CHAPTER TWO

LITERATURE REVIEW

This chapter presents background and a brief description of a healthy and unhealthy eating behavior, courseware, multimedia, edutainment, game in health care, Game based Learning (GBL), and educational game design. We will continue this chapter by discussing ideas of previous works. The direction of this study is summarized the end of this chapter.

2.1 YOUNG CHILDREN AND COMPUTER TECHNOLOGY

Computer technology plays an important role in our lives. It is an essential tool to encourage students to learn. This is one of the techniques or teaching methods to improve the people in a learning process (Yusup, 2002). In educational settings, technology can be used in an elementary or secondary school, public or private universities and also as a tool for students to study at home (William, 2002). According to Wright and Shade (1994), computer technology can provide potential benefits in child development and learning processes. This concept will be to produce an effective education and interdisciplinary while making technology in the learning process. Computer technology can be integrated into the preschool program to develop good cognitive and social skills for preschool children (Clement, 1994).

In children development, ages five and six years are the appropriate age to adapt to computer technology. The children are willing to explore and use the computer to support the process of learning. According to Clement (1994), one strategy to enhance teaching and improve learning is to integrate computer technology into the curriculum and necessary exercise. This tool can help and assist preschool children to be more efficient and effective compared to traditional teaching methods (Haugland, 2000).

2.2 COURSEWARE

Oxford Advanced learner's Dictionary (2005) defines course in ten different ways. For course in education mean sequence of learning, a lesson or a lecture on particular subject. Courseware refers to computer programs that are designed to be used to teach a subject. Ayub, Venugopal and Nor, (2005) and Vassileva (1992) define courseware as teaching material that be guide and manipulate individually and interactive mode to ease the student while Ali and Zaman (2006) defined the courseware is must be stand-alone, self- learning unit, content of various multimedia elements. In order to make effective learning, the presentation part is the most important one.

According to Saad Idris, Cheong, Razak and Nor (2007) in Malaysia, the Math and Science courseware id designed and developed by Malaysian Education Technology Department (METD) To support the implementation of the teaching of mathematics and science in English. This courseware is used as a model for pronunciation of scientific terms and acts as a tool to teach special education that lack proficiency in English. Abtar (2000) gave a critical analysis of educational software produced by private companies. It was criticizes that the private sector produce the courseware which are attractive in graphical presentation but lack pedagogical value.

The success of the courseware is totally depends how the presented. According to Khalifa, Bloor, Middelton and Jones (2000) the main criteria for courseware is the quality of it. There are 22 criteria for developing and test courseware as list in Table 2.1.

Table 2.1: Criteria for developing and test courseware.

CRITERIA FOR DEVELOPING AND TEST COURSEWARE	
Quality of software program	Suitable for group work
Pass first level	Clear menu
Ease of use	Encourages creativity
Interactive learning	feedback, and printing work
Challenging games	Appropriateness to the curriculum
Level of difficulty	Concentration games
Use of command language	Well Designed
Clear features	Problem solving
Age appropriate	Entertaining
Thinking games	Critical thinking skills
Exercise and tests	Use of mouse

Criteria for Developing and Test Courseware. (Khalifa, Bloor, Middelton and Jones ,2000)

2.3 MULTIMEDIA

Today, where education plays an important role in human life, technology has become one of the components to support the school especially in education and learning. Multimedia Technology is one of the technologies that have been accepted widely throughout the world for teaching and learning. This technology can provide the motivation for the learning process in terms of the fact that multimedia technology where it can affect many of the learners. Interactive multimedia range has the ability to change the activity in the lives of people such as the way to learn and communicate and work (Stemler, 1997).

Multimedia definition can be seen from the perspectives of different. According to Feldman (1997), multimedia is a combination of media such as video, sound, animation, text, graphics which manipulate and integrate into the digital setting. In addition, Maddux, Johnson, and Willis (2001) indicated the multimedia contains of computer program which consist of text and one of other Medias such as audio or sophisticated sound, music, video, photographs, 3-D graphics, animation, or high-resolution graphics.

2.3.1 The strength of using multimedia in education

Multimedia has been defined largely in different areas, not only in the education and computing communities but also in the general public. Education is seen as a domain that has the potential to use multimedia technology. It confirmed the benefits of multimedia in education settings. This condition can also see the power of multimedia in education (Phillips, 1997):

- Mixed media

  Multimedia has a combination of media such as animation, text, digital video, sound, etc. It can be a benefit in several technology conditions compare to mono-media assets, for example whiteboards and audio tape/cassettes. The main advantages are the ability to use the most appropriate medium for necessary message such as text for thoughts and animation for dynamic information.

- User Control

  In most multimedia (interactive multimedia), users can use their own path through the material by their preference and they have potential to build up their own knowledge. With the development of the design of user interface, it allow user to control the material while they can support deep learning at the same time.

- Simulation and visualization

  Multimedia is very useful and an important aid as a discourse that can be projected simulations of the complex concept in a class situation. additionally, it benefits the student by using the self-simulation training to use as building tools.

- Different learning styles

  Learning styles are the ways to processing information, feeling and behaving in learning situations selected by the individual characteristics (Smith,1983). Each person has his/her learning styles. This condition make multimedia has

the potential to accommodate people. Students can become more flexible in their mental processes rather than being restricted to their known style by adopting different strategies. Multimedia has the potential to create a learning environment that multisensory learning specific support, while at the same time to convince the students to go beyond their own style, as much as possible.

2.3.2 Implication of multimedia to this study

The term multimedia component contributes to developing the prototype; some of these components are adapted to GBL used in the production of the Pre-school GBL. The strong point of multimedia in teaching and learning provide the advantage to be implemented to this study.

2.4 EDUTAINMENT

Edutainment is combination of the term "education" and "entertainment". It is a broad term for the combination of educational and entertainment use on a variety of media platforms, including video games (Egenfeldt & Nielsen, 2006). In terms of video games itself, it is related to use all type of video games or computer games, console games, or even handheld games to be used as a tool to educate. The concept of edutainment concept is not directly translate as large profit return, game companies still tend to strengthen the appeal for worried parents, measure up to 20 years ago (Buckingham & Scanlon, 2002; Mamer,2002). The current situation of edutainment is that titles with different education approach than behaviorism are commercially outmaneuvered by the traditional concepts of edutainment; which is a development accelerated by consolidation in the edutainment market in the middle of the 90th years

(Andersen & Dalgaard, 2005; Buckinggham & Scanlon, 2002; Konzack, 2003; Leyland, 1996; Willis et al., 1987).

2.5 USING VIDEO GAME IN EDUCATION

Generally, it is imperative that the current results to learn positive and promising results (Table 2.2). There is some reason to doubt, however, because they are not addressing the lack of control groups, and researcher bias assessment tests are weak, and exposure for a short time enough. A similar picture emerges if we look at the relevant research on the use of educational simulations. Although, the overall pictures here are also positive, methodological flaws and contradictory results that have become common (Bredemeier & Greenblat, 1981; Dorn, 1989; Randel et al., 1992; Wolfe & Crookall, 1998).

Table 2.2: An overview of studies on the effectiveness of learning from video games

Author(s)	Year	Genre	N	Subject	results
Levin	(1981)	Action	-	Math	Video games are it could be one of the most important tools for teaching the children the mathematical concepts
White	(1984)	Simulation	32	Physics	By playing and practice the games will enlighten the students to find solutions in various courses such as physics or any other related areas

Forsyth & Lancy	(1987)	Adventure	120	Geography	The use of geographical location in games will help the students with a better learning and find out new kinds of results
Dowey	(1987)	Puzzle	203	Dental health	The variety of learning lead children for better thinking and acquiring new habits so they will learn about dental hygiene as an example of the study.
McMullen	(1987)		37	Science	The use of the video games will not effect on the process of learning but it will increase their own thinking
Jolicoeur & Berger	(1998a; 1998b)			Fractions Spelling	Video games it could help the students while the educational software it will be more effective
Wiebe & Martin	(1994)	Adventure	109	Geography	Both learning geography facts and video games have the same purpose it is about learning activities.

Sedighian and Sedighian	(1996)	Strategy	200	Math	The outcome of learning process highly affected by integration of video games not like tradition teaching
Betz	(1995)	Strategy	24	Engineer	Video games rapidly rise among students.
Thomas ct al.	(1997)	Adventure	211	Sex education	Students acquire from the use of video games specific knowledge and extra knowledge.
Brown ct al.	(1997)	Action	59	Diabetes	The study finds out that children learn more about the diabetes and change their daily routine.
Klawe	(1998)	Adventure	200	Math	Video games are motivated on learning math.
Adams	(1998)	Strategy	46	Urban Geography	The role of urban planners through the use of Video games easier and effectiveness

Bensen ct al.	(1999)			Sexual education	Sexual education can be elaborated in proper way by the use of Video games.
Noble et al.	2000	Action	101	Drug education	Video games attractive and inspiring for the students as well they will play the video again.
Din Feng & Caleo	(2000)		47	Spelling and math	Spelling errors for those children who use video games less than peers who don't use video games.
Turnin et al.	(2000)		2000	Eating habits	Video games can teach students about eating habits and lead to significant change in every-day habits.
Liberman	2001	Action		Asthma, diabetes.	A review of a number of research projects sup-ports the notion of learning from video games.
Becker	(2001)	Action		Programming	The study discovered that the use of new technology such as video games leads to better understanding than the traditional ways.

McFarlane et al.	2002			All subjects	The study finds that teachers in general are skeptical towards the learning of content with video games However. Teachers appreciate the learning of general skills.
Gander	(2002)	Stratrgy	29	Programming	The study finds that video games are especially concern on teaching specific knowledge.
Rosas el al.	(2003)	Action	1274	Reading and math	Video games increase motivation, and there is a transfer of capability in technology from using the video game.
Squire el al.	(2004)	Simulation	96	Physics	Students using the simulation game performed better compared to the control group.
Egenfeldt-Nielsen	(2005)	Strategy	72	History	Students initially learning the same in history when using video games but have better understanding.

2.6 GAME-BASED LEARNING

Rieber (2005) indicates "learning is believed to be achieved through active engagement in which the teacher provides support, resources and encouragement". Normally, students demonstrate their participation in the play computer games much more than they appear in the work of their class.

Prensky (2005) said that in order to make learning occur, educators must first motivate and engage student in their learning activities. For engagement to occur, educator must create an environment that encourages student-teacher contact, cooperation among students and active participants between them.

Regarding the difference in engagement, the factor between media and GBL environments is the integration of the game features. Hence, the purpose of this GBL is also to investigate if a game is a better approach for motivating the interest learning than other multimedia function alone. Computer games provide a good environment for learning. The theories of learning are behavioral learning theory, cognitive learning theory and motivation theory (Sugimoto, 2007).

2.7 EDUCATIONAL GAME DESIGN

Cordova et al. (1996) have shown that enhanced learning which is fun can be more effective. Using some simple educational tasks, they demonstrated that learning embedded in a motivating setting improved learning outcomes and that engagement can facilitate learning. Learning occurs when the learner is mentally involved and actively interacts within the game, where a balance of challenge and possible courses of action is provided.

According to Alessi &Trollip (1991) educational game can be divided into three main parts such as the introduction, the body of the game and the conclusion. Figure 2.1 show these parts.

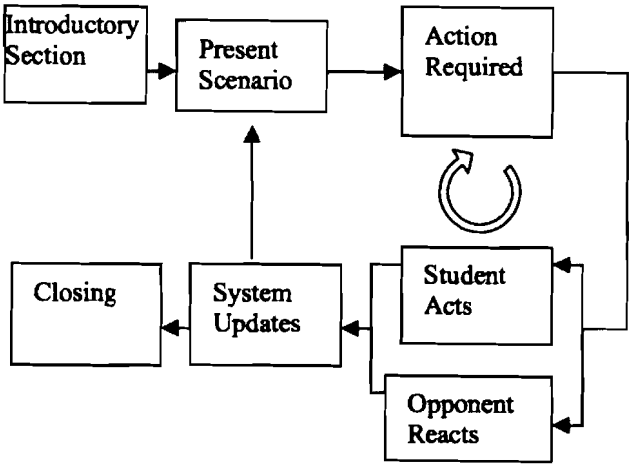


Figure 2.1: The general structure and flow of the games.

2.8 GAME IN HEALTH CARE

Game for health care is the games that move beyond the educational phase to the longer-term support of children with chronic condition. Games can use to motivate the children by "reinforcing healthy choices, reminding of treatment specifics, distracting their attention, and maintaining more complete health status and treatment record" (Watters et al., 2006).

ollak et al. (2010) had developed a game "Time To Eat" a mobile phone based intended to improve teen eating behavior. They designed the game like virtual-pet care. The game focuses on pet care as part of a child's daily routine, which fits well with behavior change models in which repeated reinforcement.

Watter et al., (2006) has developed the long term treatment game. The player will have own pet that kept in the backpack. If the player neglects to take care of the pet at appropriate times during the day the pet begins to look ill. The food choice is presented during the play of this game to feed the pet become health.

2.9 CONCLUSION

Literature review chapter contain information about Came Base Learning Courseware Research, and allow the researcher to collect many information and requirements about the research area.

Literature review contains information about, Young children and computer technology, courseware, multimedia (the strength of using multimedia in education, implication of multimedia to this study), edutainment, using video game in education, game-based learning, educational game design and game in health care.

Related work at literature review allows the researcher to full understand the research and understand the mechanism of applying the research and system. Furthermore, literature review chapter very important to collect the initial requirements and data about the research area.

CHAPTER THREE

RESEARCH METHODOLOGY

This chapter focus on the method used to accomplish this study. It covers a brief explanation about the Analysis, Design, Development, Implementation, and Evaluation (ADDIE) model. Also in this chapter, the tools and other recourses been used while developing the game will be cover.

3.1 INTRODUCTION

Research methodology is not only a collection of methods to make a research in special sector, but it is a methodical may to solve the research problems. Research method refers to the techniques and uses by researcher to performer the result such as data processing techniques and data collection techniques (Kathori, 1985).

Based on study by Vaishnavi & Kuechler (2006), the design research methodology includes the major steps as shown in Figure 3.1 these phases are:

- Awareness of Problem.
- Suggestion.
- Development.
- Evaluation.
- Conclusion.

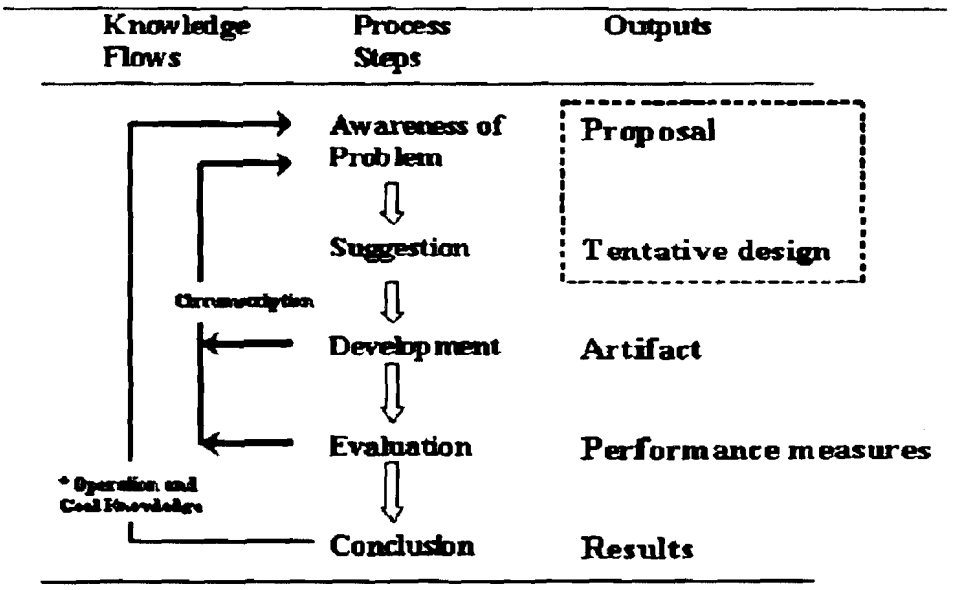


Figure 3.1: Research Design Methodology (Vaishnavi & Kuechler, 2004)

3.2 AWARENESS OF PROBLEM

The most important thing in this study is to decrease obesity in pre-schools children. We collected data through the study current of obesity in UUM kindergarten. To awareness the problem the pre-school children in the age 4-14 years old they may not know what they should eat or should not because of their inadequate ability has limited and lack of experience (Zhang, 2009). Therefore, the awareness of the problem arises because of the need to make children know which health and unhealthy food. Thus, the requirement analyses are obtained through interview at the students. The details are written in chapter four.

3.3 SUGGESTION

The study suggested using game-based learning which allows children to learn about healthy eating from the game. Game based learning use to motivate children to learn fast and also encourages them to learn from their mistakes.

3.4 DEVELOPMENT

This phase involved in developing the games based learning. There are more than 100 different ISD models, but almost all are based on the generic **"ADDIE"** model, which stands for Analysis, Design, Development, Implementation, and Evaluation, as illustrated in the Figure below. Each step has an outcome that feeds the subsequent step. Figure3.2 shows the ADDIE process.

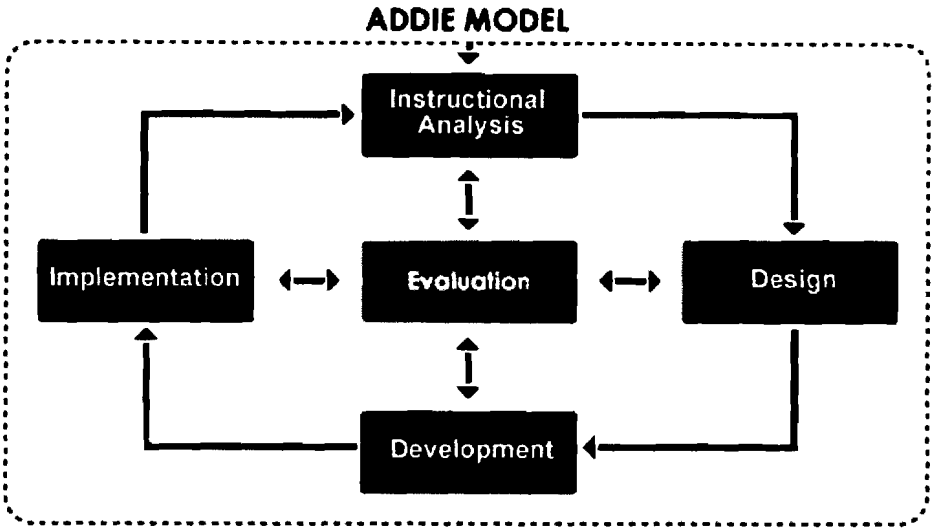


Figure 3.2: ADDIE Model (Kruse, 2002)

3.4.1 ANALYSIS

The Analysis phase is the most important phase in the ADDIE model. It identifies areas pre-school children requirements to learn about courseware prototype, a constraint exists, when this project will be completed and what will pre-school children do to determine their competency. Developer will examine the goals and objective of the presentation and the nature of participants to try to determine the appropriateness of the instructional design. For more detail see chapter four.

3.4.2 DESIGN

The Design phase is concerned with subject matter analysis, game planning and media selection. It also involves designing detailed storyboards to facilitate the media development and content integration. The user interface is an important component and is the main link between the pre-school children and the learning courseware. In this phase, all the results from the analysis phase to create a blueprint for instruction.

3.4.3 DEVELOPMENT

In this phase, all audio, image, and nutrition content are collected, prepared, created and ready to be tested. Adobe Flash CS3 used to create animation and make the game look interactive. Sound Forge used as audio tools. Adobe Photoshop CS3 used to edit and create the pictures. Java creator used to create game platform. The content development team develops instructional media based on the outcomes of the design phase (requirement analysis).

3.4.4 IMPLEMENTATION

The implementation phase consists the testing of the courseware HHM prototype with the pre-school children. The children will use Graphical User Interface (GUI) to take part in training instruction. As we know, new product usually represents a departure from the way business is currently done.

3.5 EVALUATION

In the evaluation phase, the children and the instructional system are investigated to decide whether revisions are necessary or not. This phase includes children and teacher provides feedback on the effectiveness of the games. The details are written in chapter five and six.

CHAPTER FOUR

SYSTEM ANALYSIS AND DESIGN

This chapter discussed about the user requirement and design for the courseware HHM prototype. The analysis has been done using a set of questionnaires which consists of descriptive static and reliability analysis. The data analyzed by using the statistical package for the social science (SPSS).

4.1 REQUIREMENT ANALYSIS

The analysis of requirement is a very important phase for Happy Healthy Meal (HHM) to develop the prototype. This is to obtain the requirement for the development of the HHM. Johnson (2004) and Akili (2005) have shown the requirement can be provided and guidance design or redesign the system to evaluate potential areas to improve the system. This project used the summative evaluations which all the processes were judging value of software at the end of software activities (Bhola, 1990). The HHM user requirements were conducted in UUM kindergarten on ten children. Each of them was given short explanation regarding the requirements and what they want to be implemented in the prototype. Once they understood, the respondents were given a series of questionnaires for requirement that appears in Appendix A.

4.2 INSTRUMENT FOR USER & REQUIREMENT ANALYSIS

This section described the data analysis adopted in this study. The questionnaires for the analysis of user requirement are instruments developed to identify the user requirements for courseware HHM. The questionnaires are divided into forth parts: Demographic, Background in Computer, User Requirement and list of interview question.

4.2.1 DESCRIPTIVE STATISTIC OF DEMOGRAPHIC RESPONDENTS

We use descriptive statistics to describe the main features of the data in this study. It provides simple summary of the sample and measures. Used descriptive statistics to describe quantum appears in the form of censorship. Descriptive statistics can simplify a lot of data in a practical way. All descriptive reduce a large amount of data and make it more simple. Assess evaluation from user opinion will toward to the usability of courseware HHM. The summaries of demographic of the respondents are presented in Table 4.1.

Table 4.1: the demographic of data.

Demographic data	Number	Percentage (%)
1. Male	3	30%
Age		
2. 8-14 years	8	80%

Respondents male are 3 (30%) respondents and female 7 (70%) respondents. Respondent age is divided by two; respondent who between four to seven years are 2 (20%) respondents, respondent who between eight to fourteen years are 8 (80%) respondents.

4.2.2 RESULT OF THE USER EXPERIENCE USING COMPUTER

This section is talking about the user skill with the computer. Five questions have been asked in this section. The result will be used as guiding principle to the development of HHM prototype.

The first question asked about using computer before level 1 and Figure 4.1 shown that. About 8 (80%) of the respondents are experienced using the computer while 2 (20%) of the respondents are not experienced using the computer before entered to form 1.

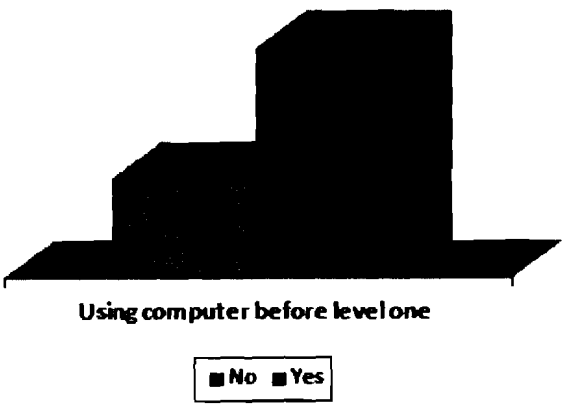


Figure 4.1: User experience using the computer before entered to form 1

The second question asked about how often the respondents used the computer Figure 4.2 shown around:

- The respondents are used the computer daily about 3 (30%).
- The respondents are used the computer weekly about 2 (20%).
- The respondents are used the computer sometimes about 2 (20%).
- The respondents are used the computer about 3 (30%).

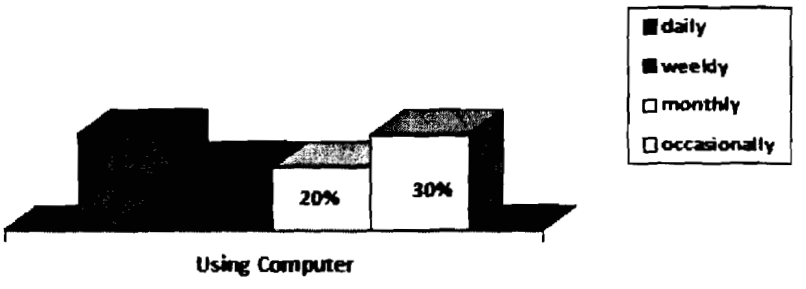


Figure 4.2: Frequencies of the user using the computer.

The third question asked about the time that respondents had been using the computer Figure 4.3 shown around:

- The respondents used the computer less than one year around 5 (50%).
- The respondents used the computer between 1 to 2 years around 1 (10%).
- The respondents used the computer between 3 to 4 years around 1 (10%).
- The respondents used the computer more than four years around 3 (30%).

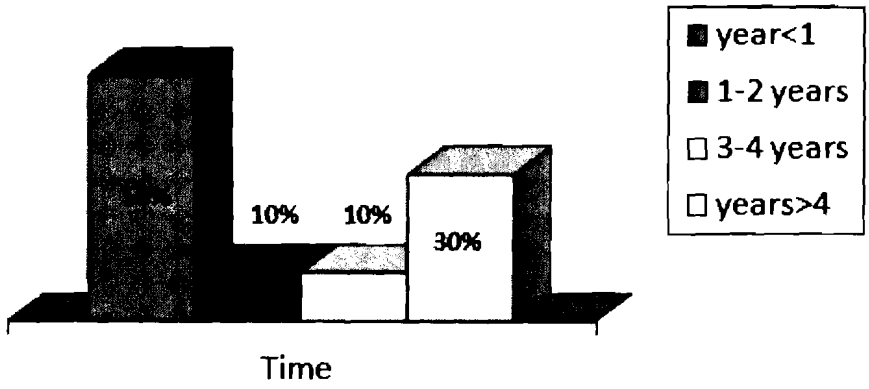


Figure 4.3: period of the user using the computer.

The fourth question asked about where the respondent place most used the computer is shown in Figure 4.4 around:

- The respondents used the computer is at school around 2 (20%).
- The respondents used the computer is at home around 5 (50%).
- The respondents used the computer is at school and home 3 (30%).

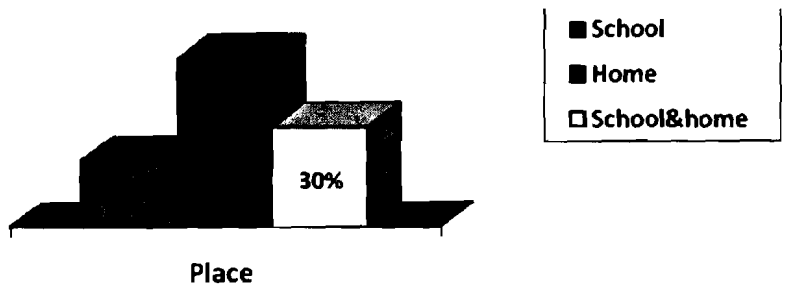


Figure 4.4: Place most used the computer

The fifth question asked about where the respondent place learned to use the computer is shown in Figure 4.5 around:

- The numbers of respondents are receiving computer training at school around 5 respondents.
- The numbers of respondents are receiving computer training at home around 4 respondents.
- The numbers of respondents are receiving computer training at school and school around 1 respondent.

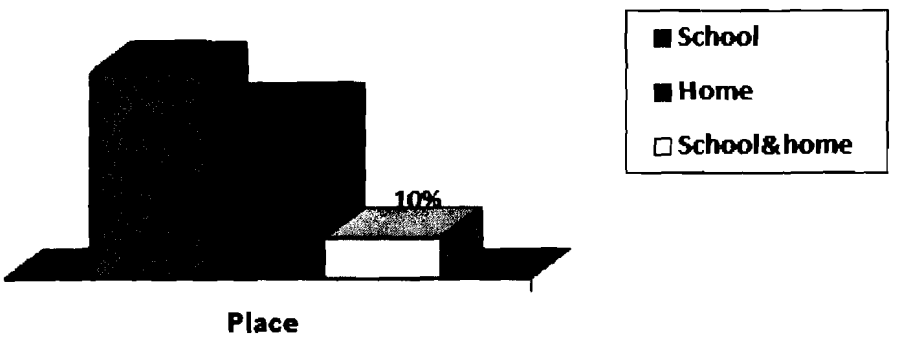


Figure 4.5: Place learned most the computer.

4.3 RESULT OF USER & REQUIREMENT ANALYSIS

In this part of user requirements evaluation is to assess user requirements in regularity. There are several question have been asked to the children about what they needed for the prototype. The result will be used as a guiding principle development of HHM game.

4.3.1 COLOR

Color is an important aspect that must chose carefully in the game, it makes respondents more active with HHM prototype. This question is described about the background color for HHM prototype. We asked about which is most suitable color between light and dark color to use it in the game. Around 8 (80%) of the children

choose the light style color to become the background of the prototype and 2 (20%) of the children choose the dark style color to be the background of the prototype. Figure 4.7 illustrated that.

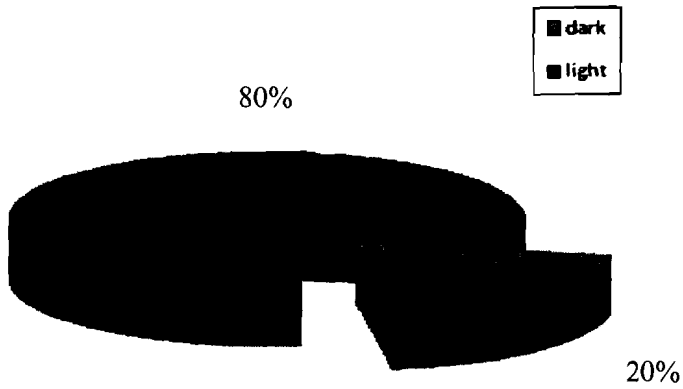


Figure 4.6: Type of color chooses by children.

4.3.2 TYPE OF PICTURES

This question asked about pictures that will be used font of HHM prototype. Around 5 (50%) of the respondent choose the real pictures to become use in prototype and 5 (50%) of the respondents choose the cartoon picture to be the pictures of the prototype. Figure 4.8 illustrated this.

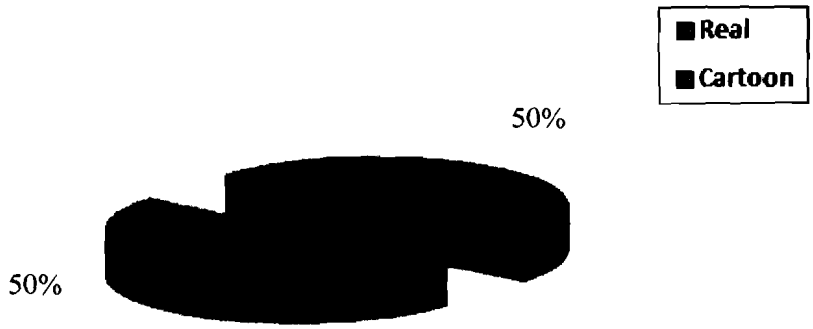


Figure 4.7: Type of pictures chooses by children.

4.3.3 TYPE OF BACKGROUND

This section discussed about the background type for HHM prototype. Only one question has been asked in this section. The item was asking about the background animation for HHM prototype. Around 8 (80%) of the children choose the animation background and around 2 (20%) of the children choose the fixed background of the prototype. See Figure 4.8.

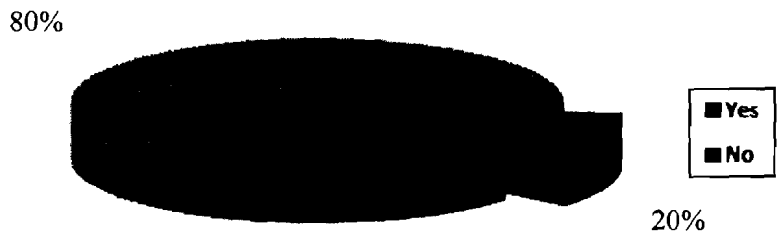


Figure 4.8: Kind of background chooses by children.

4.3.4 THEME

Themes graphics is appearance like background with some effect like a graphics skin. This question the children choose what theme they want simple, corporate, artistic or childish theme. Around 2 (20%) of the children choose the simple theme while 1(10%) choose the corporate theme. The balance choose artistic theme 1 (10%) of the respondents and childish theme 6 (60%) respondents. See Figure 4.9.

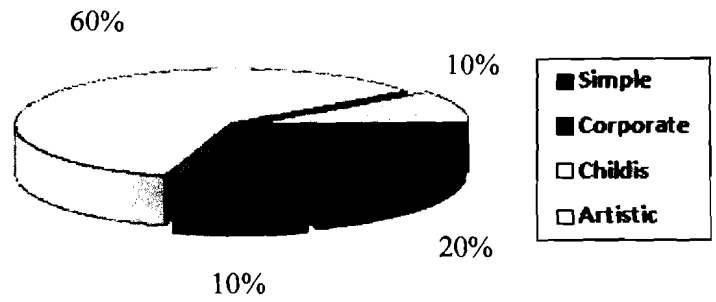


Figure 4.9: Theme selected by children

4.3.5 SOUND

This question discussed about the music background for HHM prototype. We asked about music if it is suitable to use or not suitable to use it in HHM prototype. Around 9 (90%) of the children like to hear music while playing the game. Around 1(10%) of the children not like to hear music while playing the game. See Figure 4.10.

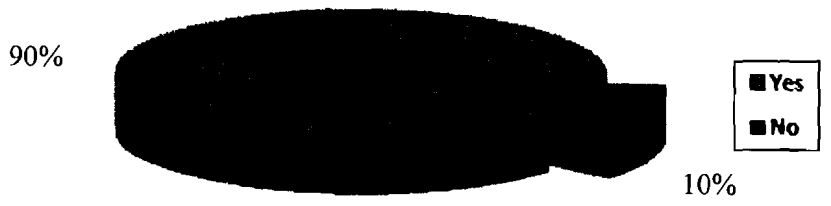


Figure 4.10: Background music

4.3.6 CHOICE

In this part, we discussed about method that used in quiz part. We asked them about type of choice that they want custom and match, objective, interactive and multiple. Around 1(10%) of the children like to take quiz by custom and match method. Around 1 (10%) of the children like to take quiz by objective method. Around 3 (30%) of the children like take quiz by interactive game method. around 5 (50%) of the children like to take quiz by multiple choice method. see Figure 4.11.

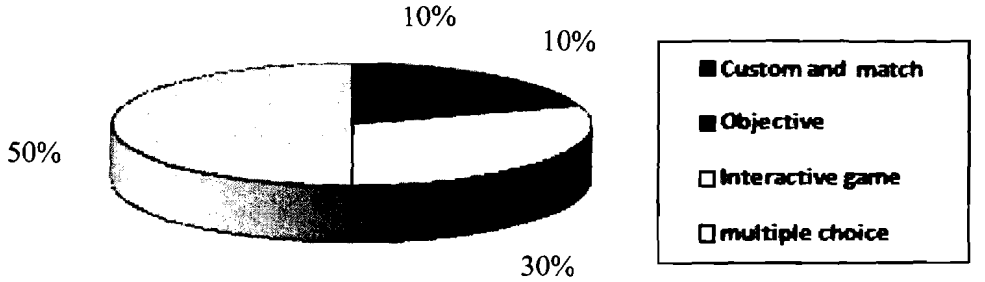


Figure 4.11: training choice.

4.3.7 LIKERT SCALE QUESTIONNAIRE

In this part, it is represented descriptive statistic measures those included mean, minimum, maximum and standard deviation of question scales. Mean is used to calculate the average for set of data; it can calculate by add a set and dividing the number of item inside the set. The minimum selected range one (strongly dislike) to two (dislike). The maximum selected five (strongly like) that mean the prototype very useful. The standard deviation is most frequently occurring scale found in set of data.

4.3.7.1 GRAPHIC

The graphic category consist of two item about the background and font color must be different and the icons must be appropriate, good combination between background, colors and icons can make the game more attractive and bad combination make it boring. Mean for background and font colors to be different is 3.5 (0.85) and mean for software must use the appropriate icons 3.9 (0.876). We can conclude the respondents need to differentiate between background and color and they want also to makes icons appropriate. Table 4.2 shows graphic measures.

Table 4.2: Descriptive Statistics for Graphic Measures

GRAPHIC DESCRIPTIVE STATISTICS					
	N	Minimum	Maximum	Mean	Std. Deviation
Background and font colors to be different?	10	2	5	3.50	.850
Software must use the appropriate icons	10	3	5	3.90	.876

4.3.7.2 MEDIA

Media category consist of three items, the first item about learning software must have a video, second item about prototype must include video and must be easy to understand and the last item was asking about special sound that must include in HHM prototype (sound effect). Mean for game must have a video 4.40 (0.699), mean for video must be easy to understand 4.60 (0.516) and mean for the game should include sound effect 4.20 (0.422). It can conclude the most respondents like to include video that easy to understand in HHM courseware and almost respondents like to support sound effect in game. Table 4.3 show media measures.

Table 4.3: Descriptive Statistics for Media Measures.

Media Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Learning software must have a video	10	3	5	4.40	.699
Video must be easy to understand	10	4	5	4.60	.516
Learning software must have a special sound (sound effect)?	10	4	5	4.20	.422

4.3.7.3 NAVIGATE

The navigation category consist of one item about the game must be easy to navigate through levels. Mean for navigate 4.50 (527) it mean almost all respondent agree to make the courseware easy to navigate. Table 4.4 show media measures.

Table 4.4: Descriptive Statistics Navigate Measure

Navigate Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Software must be easy to navigate	10	4	5	4.50	.527

4.3.7.4 QUIZ

The quiz category consists of two items. The first item have been asked the respondent about the quiz must be easy to answer and the second item have been asked about the quiz must be tested the mind. Mean for quiz must be easy to answer is 4.30 (0.823). Mean for quiz must test the mind is 4.60 (0.699). It can conclude the respondent need the quiz clear and easy to understand but the quiz test the main in the same time. Table 4.5 show media measures.

Table 4.5: Descriptive Statistics for Quiz Measures

Quiz Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Requested each quiz must be easy to answer?	10	3	5	4.30	.823
Each quiz must test the mind?	10	3	5	4.60	.699

The measure that get the highest mean is navigate category (4.5) then quiz category (4.45), media category (4.4) and the lowest mean is graphic category (3.85). All mean measures for all respondents were 4.2875 (0.715006). See Figure 4.12.

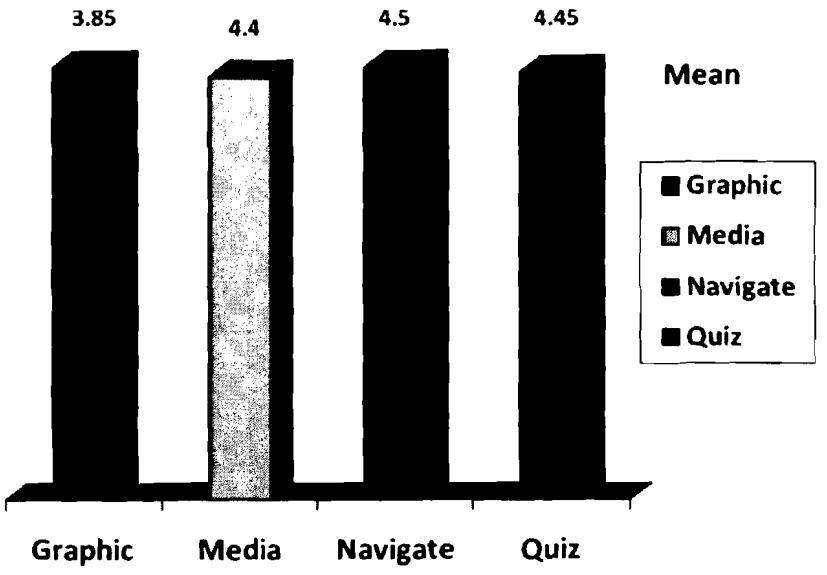


Figure 4.12: Descriptive statistics for categories measures.

4.4 DESIGN PHASE

For developing this courseware, the designing part is one of the most significant aspects must be included. The courseware is developed according to the concept educational game. So, the design must engage multimedia elements like graphics, animation, text, color and browsing with educational elements such as information that will be present in game. The application interface must be a pleasure and a joy to bring the benefits preschool children in the educational procedure.

For the elements of courseware, it has been used light colors for background, simple animation for movement, cartoon pictures and simple audio also included. It should be able to assist preschool children in developmental when they used more than one color. In addition, the graphics has also been included in the courseware to appeal the attention from them. The courseware is used the picture that familiar with them and suitable for children, for example, apple, orange, chocolate and some objects that relate to the courseware.

4.4.1 SOFTWARE TOOLS

To design the courseware based on this concept, there are several software that used to designing the interface for a HHM prototype for preschool children as following:

1. Adobe Photoshop CS3.
2. Macromedia Flash Professional 8.0.
3. Java Creator LE.

4.4.1.1 ADOBE PHOTOSHOP CS3

Adobe Photoshop CS3 is a graphics editing software developed and released by company Adobe Systems Incorporated. Adobe Photoshop CS3 and instruments have been used in project implementation. Function of the tools to create and edit the graphics. Involved in the design interface, and graphics is also a strong element of the text.

4.4.1.2 MACROMEDIA FLASH PROFESSIONAL 8.0

Macromedia Flash Professional 8.0 has been used in project development. Flash is software for developing animation and user interfaces. This application can help to integrate graphics, text and, animation into rich experiences that deliver better results for HHM courseware. There are several advantages when using the flash for example capability rich graphics, file sizes are small, as well as consistency. See Figure 4.13.

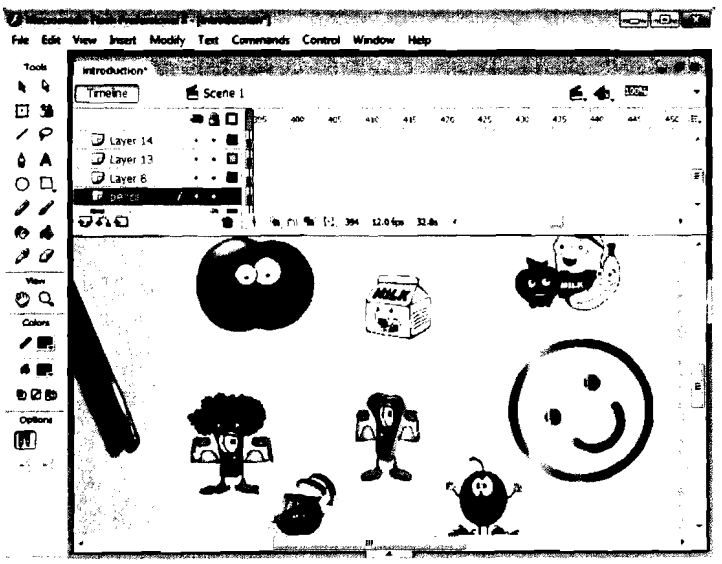


Figure 4.13: Macromedia Flash Professional 8.0

4.4.1.3 JAVA CREATOR LE.

The application development presented the language that used to build this application in order, Java used to develop this application. Since Java is in such wide use. See Figure 4.14.

Figure 4.14: Java creator.

After complete the part of programming language and design the interface, integrating is the second part to ensure the application is accessible to use. Before integrate interface in java, the components of Flash must be add in the tool.

4.4.2 STORY BOARD

The happy healthy meal courseware has been developed by using adobe Photoshop CS3, macromedia flash 8 and Java creator. This application consists of many menus like play game, healthy food, unhealthy food, story, quiz and RMI. following diagram shows the user interface.

4.4.2.1 INTRODUCTION SCREEN

Figure 4.15: Template Screen for Introduction

Figure 4.15 introduction screen will appear when the game is running. This screen will show the name of the game and certain elements of graphic and animation is includes an appeal to the children focused. Hypertext "skip" will appear at the bottom of the page and once users click mean menu will appear.

4.4.2.2 HOME PAGE

Figure 4.16 shows feature of HHM prototype interface for main menu. This menu consist of six submenu play game, helathy food, unhealthy food, quize, story and RMI.

Figure 4.16: home page.

4.4.2.3 PLAY GAME MENU

The game menu shows where the children will start to play game. It will provide instruction how to play before children start to play. the play game has three levels in each level has several stage, in this game player has charterer (boy) that he/she must take care it by fed him healthy food. If the children click on unhealthy food, the character will be getting fat till game is over but if the children on the healthy food, the character will be healthier like red cheek, smiling, jumping. This game has many pictures about healthy food and the charterer has several situations as following:

1 Healthier situation.

2 Happy situation.

3 Normal situation.

4 Overweight situation.

5 Obesity situation

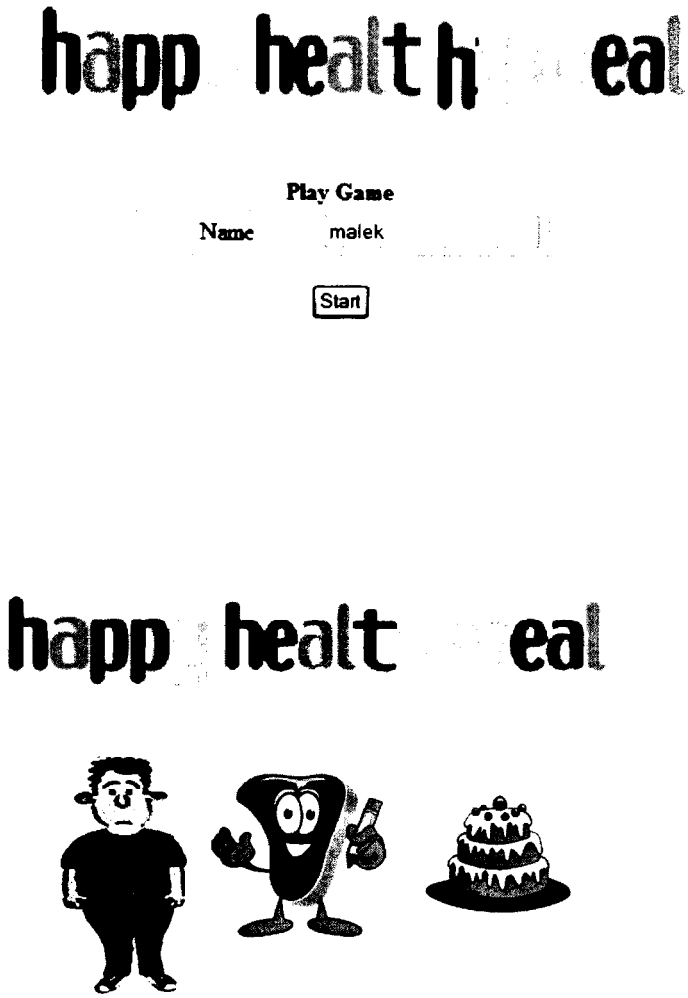


Figure: 4.17: play game.

4.5 TESTING

Test is the last part in the development of this courseware. This phase usually connected with the implementation and testing parts. Faze Test help to assess whether the courseware meets the requirements and the need for the user. Questionnaire is approach used to gather data from the users.

4.6 SUMMARY

This chapter analyzed all data collected during requirement analysis questionnaire. All the data collected in this phase was analyzed and summarized. The respondents like light color to be background more than dark color. Respondents preferred cartoon pictures more than real pictures. Respondents chosen animation background with music background. For quiz part respondents have chosen multiple choices to provide in HHM prototype. Most of respondents strongly like to support go navigate throw the game.

CHAPTER FIVE

RESULT

This chapter explained the data analysis of the courseware HHM prototype. The method used for data acquisition and collection in this project is User Interface Satisfaction evaluation (QUIS) a questionnaire. SPSS version eighteen is used as the tool to measure data. Result of this research will be discussed using the descriptive statics.

5.1. DESCRIPTIVE STATISTICS OF USER INTERFACE SATISFACTION

User satisfaction evaluation was important for the study to judge on the output of the development of HHM prototype. The HHM user interface satisfaction was conducted on twenty respondents in UUM kindergarten. Each of the respondents had been taught to use the system prototype, the system functionality, objective and description had been informed to the participants. Each of them was given brief explanation regarding the user satisfaction evaluation to the prototype. The main objective to do that is to get the level of user satisfaction and agreement in term of the usefulness and the ease of use with the operability of the courseware HHM prototype.

According to Holzinger (2005) Said the test of usability with respondents is important methods for usability evaluation. Neilson (2006) indicated three parts to conduct usability test, usefulness level, operability and ease of use. In this study a system

usability test was conducted through the adoption of quantitative method. After they understood, the respondents were given a set of questionnaire that shows in appendix B.

5.2. DATA ANALYSIS

This section described the data analysis adopted in this study. The data analyzed by using SPSS version eighteen. The analysis covered the following parts. First descriptive statistics of general information, reliability test results and result of interface satisfaction evaluation.

5.2.1. DESCRIPTIVE STATISTICS OF GENERAL INFORMATION

Demographic analysis of respondents has been used to show the basic data. It is generally provide question about the user personal information such as gender, age, and experience of user used a computer. See Table 5.1.

Table 5.1: Demographic Data

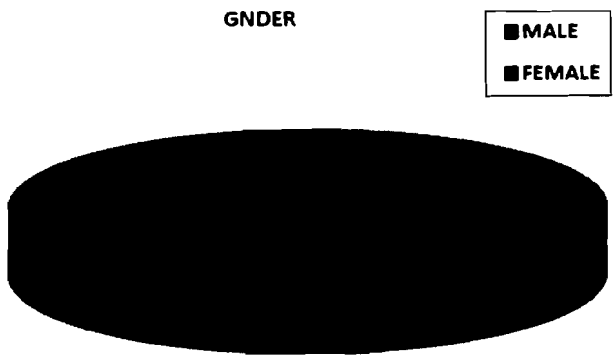
Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	MALE	9	45.0	45.0	45.0
	FEMALE	11	55.0	55.0	100.0
	Total	20	100.0	100.0	
Age					
		Frequency	Percen t	Valid Percent	Cumulative Percent

Valid	4-7	11	55.0	55.0	55.0
	8-14	9	45.0	45.0	100.0
	Total	20	100.0	100.0	

Experience in Computer

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	No	3	15.0	15.0	15.0
	yes	17	85.0	85.0	100.0
	Total	20	100.0	100.0	

Figure 5.1 represented ten respondents are chosen for testing courseware HHM prototype in UUM kindergarten. Which are nine for boys and eleven for girls. The sample present that the respondents from girl were more (55%) than boy (45%). The respondent ages between four to seven years old are four (40%) and respondents between eight to fourteen years old are (60%). moreover, There are nine respondents (90%) have an experience in using computer than eleven respondents (10%) never used it. See Figure 5.1.



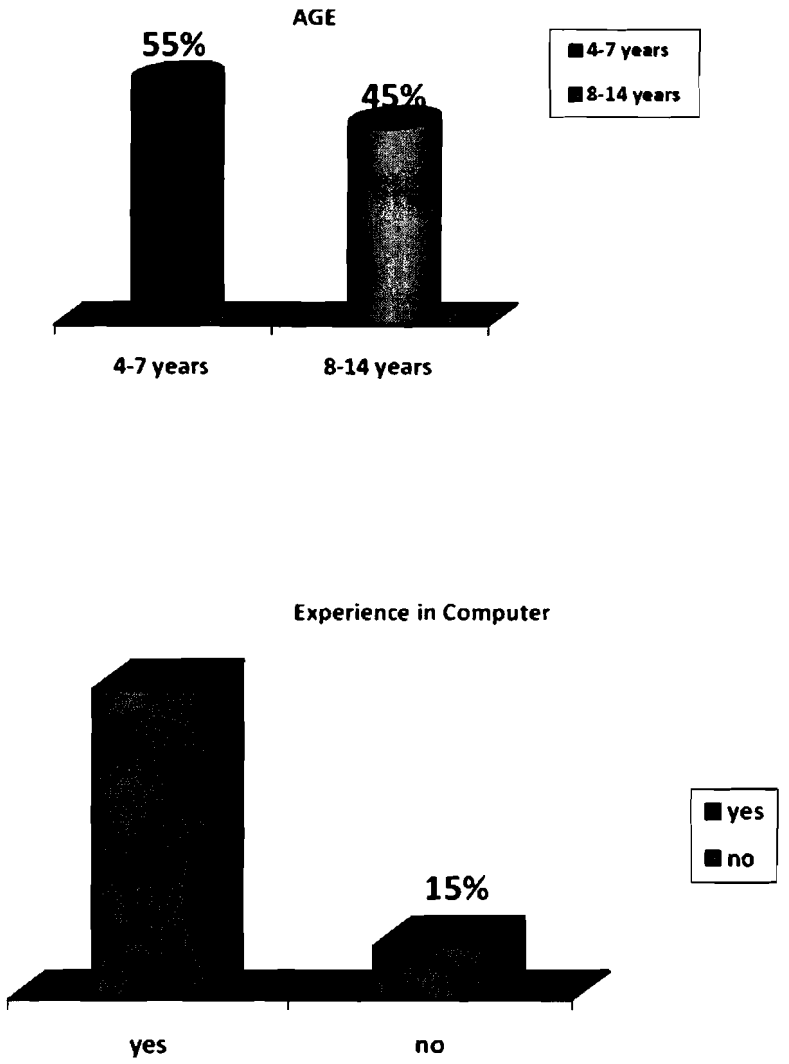


Figure 5.1: Demographic data analysis of respondents.

5.2.2. RELIABILITY TEST RESULTS

Reliability is defined as the degree which measurements are free from error and hence yield consistent results. Reliability is operationally defined as the internal consistency of a scale that asses the degree to which the items measured are homogeneous. Writing guides (2009) define reliability as the extent to which an experiment, test or any measuring procedure would yield the same result on repeated trials. Zikmund

(2003) has coined a simple definition for reliability and state it as the degree to which measures are free from errors and thus yield consistent results.

The variables and the Cronbach's alpha calculated using SPSS version 18 to determine reliability which assesses the degree of internal consistency between multiple measurements of a dimension. The game effectiveness to the courseware, game screen, game learning and Game qualification have Cronbach Alpha greater than 0.7. According to Cavana, Delahaye and Sekaran (2001) the Cronbach Alpha values greater than 0.7 was counted as acceptable to use as a questionnaire. The most measure that has high values were section game learning (0.870) and game qualification (0.850). The Cronbach Alpha value for all dimensions is 0.837. See Table 5.2.

Table 5.2: the test Reliability (Cronbach's alpha)

Variables	**No of items**	**Cronbach's alpha**
Game effectiveness	6	0.800
Game screen	4	0.828
Game learning	3	0.870
Game qualification	3	0.850

5.2.3. RESULT OF INTERFACE SATISFACTION EVALUATION

Table 5.3 shows the descriptive statistics for all the categories. The mean response for game effectiveness by children was 4.24 (SD = 0.71), the mean response for game screen by children was 4.0 (SD = 0.72), the mean response for game learning by children was 3.92 (SD = 0.79) and finally mean response for game qualification was 4.14 (SD = 0.69), as a result. The mean response for all measure was 4.1 (S.D = 0.7201).

In general all the respondents are satisfied the user interface of HHM prototype. The highest mean was game effectiveness and game qualification. These result because the interface was simple and easy to use for preschool children. It has pictures icon and using pictures to learn make children easy to remember more than text.

Table 5.3: Descriptive Statistics for All Measures

variables	No of respondents	Mean (average)	Standard Deviation
Game effectiveness	20	4.24	0.71
Game screen	20	4.0	0.72
Game learning	20	3.92	0.79
Game qualification	20	4.14	0.69

Table 5.4 lists the summary of the respondents for all items. The table indicated that most of the participant highly agreed to all the items that are related to the courseware HHM prototype.

The first category is about *game effectiveness* to the prototype. It asked about the courseware is easy to use, flexible to use, adequate to needed, satisfy to use it, easy to understand and wonderful. The higher mean in courseware was wonderful (4.25), followed by flexible and easy to use (4.25). It concluded the user satisfied with game effectiveness. This is because HHM courseware has good design.

The second category is about *game screen* of prototype. It asked about the design screen are easy, words used in the game are clear and organization of the game is clear. The higher mean in courseware was game's diagram is clear (4.00) followed by organization of game is clear (4.00). It concluded the screen and layout prototype designed in very well that make the users satisfied with game screen.

The third category is about *game learning* of prototype. It asked about the game operate are easy, learning by pictures is active way and supplementary material is clear. The higher mean in courseware was supplementary material is clear (4.00) followed by Easy to operate the game (3.90). It concluded the children can play the game without they have experience in computer because the game depend on in the pictures to learn more than text and the language are used simple that make the game easy to understand.

The last sections are about the *game qualification*. It asked about the reliability of system, suitable, game speed and easy to navigate. The higher mean in courseware was easy to navigate was (4.30) followed by game speed (4.5). It concluded the children satisfied with the performance of the game.

Table 5.4: Descriptive Statistics for All Items.

Descriptive Statistics

Variables	N	Minimum	Maximum	Mean	Std. Deviation
GAME EFFECTIVENESS					
HHM is wonderful.	20	3	5	4.25	.716
HHM is easy to use.	20	3	5	4.25	.716
HHM is satisfying to use.	20	3	5	4.20	.693
HHM is flexible to use.	20	4	5	4.25	.639
HHM is adequate as needed.	20	4	5	4.20	.768
HHM is easy to understand.	20	4	5	4.20	.768
GAME SCREEN					
Game's diagram is clear	20	3	5	4.00	.858
Organization of game is clear	20	3	5	4.00	.795
Words used in the game easy to read	20	3	5	4.00	.649
Screen design is wonderful	20	3	5	4.00	.725
GAME LEARNING					
Easy to operate the game	20	3	5	3.90	.788
Learning by pictures and quiz active way	20	3	5	3.85	.813
Supplemental reference material is clear	20	3	5	4.00	.725
GAME QUALIFICATIONS					
HHM is reliable	20	3	5	3.90	.641
HHM is suitable for all pre-school level	20	3	5	4.10	.641
HHM speed is fast	20	3	5	4.25	.639

Easy to navigate	20	3	5	4.30	.657

5.3. SUMMARY

This chapter discussed the analysis data obtained by using the questionnaire. It was described and summarized the respective of participants toward HHM prototype. It can be summarized that the respondents satisfy with the HHM prototype.

CHAPTER SIX

CONCLUSION

This chapter focuses on the conclusion and recommendation of this study. The Conclusion will explain how this study achieved the goals, according to the objectives and problem statements of this study. Finally, brief recommendations given as contributions to future enhancements also discussed.

6.1 CONCLUSION

All the objectives of the research have been achieved which is developed a courseware prototype for preschool children in kindergarten. This application is to learn children between four and fourteen years old what healthy food are. Moreover, developing this application can help them to improve their skill to recognize between healthy and unhealthy food. This prototype can be alternative way to educate them about healthy food by engage them with game functionality. The Happy Healthy Meal prototype has been developed and received the feedback from users by requirement analysis questionnaire at UUM kindergarten. Based on the results, researchers found there are several factors that are helpful in developing this application such as multimedia elements. The "ADDIE" model, which stands for Analysis, Design, Development, Implementation, and Evaluation, is used as a methodology in this project. After the evaluation process, the objective to develop the prototype and fulfill

the educational game is successful and also the accuracy will be determined in development this prototype.

6.2 LIMITATION

The aim of this project is to create a new method of learning for preschool children in kindergarten schools. Since finished this project, there are many problems reduce the development of this application. The limitation as following:

6.2.1 TIME CONSTRAINTS

This project has been done in four months only. Because of this, the prototype consists of three levels only with a little pictures and simple animations. Moreover, the prototype is focus on the healthy food only because the limitation time to make on the other subject areas. There are some of the levels do not develop in this prototype such as sound and videos.

6.2.2 INTEGRATION

This study has been developed by using macromedia flash CS3, Java creator and Sony sound forge. There are some of problem about integration between them such as macromedia flash platform cannot integrate with java code and also the Sony sound does not have full integration with java platform.

6.3 FUTURE WORK

Because of the time period that is not enough to ensure the functionality of the entire system, and can be made to work in the future overview of the research that came out through the work of this project. It would be more suggestive to provide advice to

those who need to follow some of the work in the future to follow every single step listed in the project. Game based learning courseware for pre-school children to learn them which is healthy food has the following features that researchers can use it in the future:

6.3.1 FEATURE ENHANCEMENT

The quality of a happy healthy mean courseware must be enhanced. Today a lot of educational games are developed. Moreover they have valuable contents with entertainment. For future, more scopes must be covered to provide variety of contents such as mathematical courseware, statistical courseware and historical courseware. In addition, the researchers must be fully understand about multimedia element to use it to motivate pre-school children in learning method such as sound, text, pictures and video.

6.3.2 SAMPLE OF DATA

The researchers must cover more samples data to get a good result. In this project we are taken sample from UUM kindergarten and feedback back from children only. In the future the researchers can take sample from different area like rural area and they can get the requirement from instrument and teachers. Moreover, the researchers can develop the courseware prototype by using other environments.

6.4 SUMMARY

This project basically complete because objective of this research can be achieved and a game based learning will be produced. This application is develop to educate children in preschool between ages four and fourteen years old which is healthy food are. In addition, hopefully this application can help them to recognize between healthy and unhealthy food.

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APPENDIX A

REQUIREMENT ANALYSIS QUESTIONNAIRE

Questionnaires

Borang soal selidik

School of computing

Sekolah pengkomputeran

Sir / Madam

This study was developed as part requirement for the Master of Science (Information Technology).The finding of this study is to obtain users requirement in software development.

kepada tuan/puan/encik

kajian ini dibangunkan adalah sebahagian syarat untuk mendapat Sarjana dalan Sains (Teknologi Maklumat). Dapatan kajian ini adalah untuk mendapatkan kehendak pengguna dalam pembangunan perisian.

This questioner it is important to get the desires or needs of requirement because it will help in determining the effectiveness of the software. This is also your opportunity to be involved directly in the development of learning software.

Peninjauan ini adalah penting untuk mendapatkan kemahuan atau kehendak pengguna kerana ianya akan membantu dalam menentukan keberkesanan sesebuah perisian itu. Ini juga merupakan peluang anda unyuk terlibat sama secara langsung dalam pembangunan perisian pembelajaran.

Therefore, all questionnaire responses and your identity will be our secret. We hope you can be member cooperation in making this review.

Oleh itu, segala jawapan soal selidik ini dan identity anda akan kami rahsiakan. Kami berharap pihak anda dapat member kerjasama dalam menjayakan peninjauan ini.

Thank you

Sekian terima kasih,

Yang benar *Malek Ahmad Theeb Almomani.*

Part A

Bahagian A

Please tick (✓) only one (1) box for each question

Sila tandakan (✓) pada satu (1) jawapan sahaja yang difikiran sangat sesuai

1. Jantina *gender*

   [ ] Lelaki *boy* [ ] gadis *girl*

2. berapa umur anda? *How old are you?*

   [ ] 4-7 tahun [ ] 8-14 tahun

Latar Belakang berkaitan Komputer *Background related to Computer*

Please tick (✓) only one (1) box for each question

Sila tandakan (✓) pada satu (1) jawapan sahaja yang difikiran sangat sesuai

Have you ever used a computer before level 1?

1. Adakah anda pernah menggunakan komputer sebelum tingkatan 1?

   [ ] Ya *yes* [ ] Tidak *no*

2. Berapa kerapkah anda menggunakan komputer? *How often do you use computer?*

   [ ] Harian *daily* [ ] Mingguan *weekly* [ ] Bulanan *monthly* [ ] Sekali- sekala *occasionally*

The experience you have using computers?

3. Pengalaman anda telah menggunakan komputer?

   Less than one year *1-2 years* *3-4 years* *more than 4 years*

   [ ] Kurang 1 tahun [ ] 1 - 2 tahun [ ] 3 - 4 tahun [ ] Lebih dari 4 tahun

4. Dimanakan anda paling kerap menggunakan komputer? *Where did you most often use a computer?*

[ ] Di sekolah *At school*

[ ] Di rumah *At home*

[ ] Di rumah dan di sekolah *At home and at school*

5. Dimanakah anda paling kerap menerima latihan komputer? *Where do you most often receive computer training?*

[ ] Di sekolah. *At school*

[ ] Di rumah. *At home*

[ ] Di rumah dan di sekolah. *At home and at school*

Bahagian B

Please tick (✓) only one (1) box for each question.

Sila tandakan (✓) pada satu (1) jawapan sahaja yang difikirkan sangat sesuai. *In your opinion, what are the characteristics deemed appropriate color for the background into the interactive CD software?*

1. Pada pendapat anda, apakah ciri warna yang difikirkan sesuai untuk dijadikan latar belakang perisian CD interaktif?

   [ ] Gelap *dark* [ ] Terang *light*

2. Pada pendapat anda, apa yang ada gambar-gambar yang sesuai untuk perisian CD interaktif? *In your opinion, what are the appropriate pictures for interactive CD software?*

   [ ] gambaran sebenar *real picture* [ ] gambaran kartun *cartoon picture*

3. Pada pendapat anda, latar belakang perisian CD interaktif sepatutnya: *In your opinion, the background of an interactive CD software should:*

   [ ] Animasi (bergerak) *Animations (move)* [ ] Statik (tidak bergerak) *Static (not moving)*

4. Apakah tema perisian pembelaj aran yang anda suka?

   [ ] Ringkas [ ] Korporat [ ] Kebudakan [ ] Artistik

5. Pada pendapat anda, perlukah muzik latar dalam perisian ini?

   [ ] Ya [ ] Tidak

6. Jenis latihan yang paling menjadi pilihan anda? *Type of training to make your choice?*

[ ] Suai dan Padankan. *Custom and match*

[ ] Objektif *objectives*

[ ] Permainan Interaktif (Game) *interactive game*

[ ] pelbagai pilihan *multiple choice*

Bahagian C

Please tick (✓) only one (1) box for each question.

Sila tandakan (✓) pada satu (1) jawapan sahaja yang difikirkan sangat sesuai

No	Soalan *question*	Sangat Tidak Suka *Very dislike*	Tidak Suka *dislike*	Neutral	Suka *Like*	Sangat Suka *very like*
		1	2	3	4	5
1	Latar belakang dan tulisan mestilah berbeza warna? *Background and font colors to be different?*					
2	Perisian mestilah menggunakan ikon yang sesuai? *Software must use the appropriate icons?*					
3	Perisian pembelajaran mestilah mempunyai video. *Learning software must have a video*					
4	Video mestilah mudah untuk difahami *Video must be easy to understand*					
5	Perisian pembelajaran mestilah mempunyai bunyi khas (sound effect)? *Learning software must have a special sound (sound effect)?*					
6	Perisian mestilah mudah untuk dinavigasi *Software must be easy to navigate*					
	Setaip latihan mestilah senang untuk dijawab? *Requested each exercise must be easy to answer?*					
8	Setiap latihan mestilah menguji minda? *Each exercise must test the mind?*					

APPENDIX B

QUESTIONNAIRE FOR USER INTERFACE SATISFACTION (QUIS)

INTERVIEW QUESTION

QUESTIONNAIRE FOR USER INTERFACE SATISFACTION (QUIS)

Sir / Madam

This study was developed as part requirement for the Master of Science (Information Technology).The finding of this study is to obtain users interface satisfaction from preschool students at UUM kindergarten.

This questioner it is important to get the finding and result because it will help in determining the effectiveness of the software. This is also your opportunity to be involved directly in the development of learning software.

.

Therefore, all questionnaire responses and your identity will be our secret. We hope you can be member cooperation in making this review.

Section A.

Gender: ( ) Male ( ) Female

Age:

Experience in Computer: ( ) Yes ( ) No

Section B

1	2	3	4	5
Strongly Disagree	**Disagree**	**Neutral**	**Agree**	**Strongly Agree**

No	FACTOR	1	2	3	4	5
	GAME EFFECTIVENESS					
1.	HHM is wonderful.					
2.	HHM is easy to use.					
3.	HHM is satisfying to use.					
4.	HHM is flexible to use.					
5.	HHM is adequate as needed.					
6.	HHM is easy to understand.					

No	FACTOR	1	2	3	4	5
	GAME SCREEN					
7.	Game's 1 diagram is clear.					
8.	Organization of game is clear.					
9.	Words used in the game easy to read.					
10.	Screen design is wonderful.					

No	FACTOR	1	2	3	4	5
	GAME LEARNING					
11.	Easy to operate the game.					
12.	Learning by pictures and quiz active way.					
13.	Supplemental reference material is clear					

No	FACTOR	1	2	3	4	5
	GAME QUALIFICATIONS					
14.	HHM is reliable.					
15.	HHM is suitable for all pre-school level.					
16.	HHM speed is fast.					
17.	Easy to navigate.					

Thank you to participant with us

APPENDIX C

GENERAL DOCUMENTS

UUM
Universiti Utara Malaysia 06010 UUM Sintok, Kedah Darul Aman, Malaysia. Tel: 604 - 928 4000

UNIVERSITI UTARA MALAYSIA

"KEDAH SEJAHTERA"

14 Disember 2011

Pengerusi
Pusat Perkembangan Kanak-Kanak
Tunku Puteri Intan Safinaz
Sisiran 2, Perumahan Kakitangan UUM
06010 Sintok Kedah

Tuan

KEBENARAN MEMBUAT KERJA LAPANGAN

Dengan ini dimaklumkan bahawa pelajar berikut telah mendaftar di dalam program MSc. IT ;

Malek Ahmad Theeb Almomani (806978)

Beliau perlu mengutip data dari Pusat Perkembangan Kanak-Kanak tuan sebagai keperluan projek akhir beliau yang bertajuk **Game-Based Learning Courseware For Pre-School Children To Learn Healthy Eating**. Semua data yang dikutip adalah rahsia dan akan digunakan untuk tujuan akedemik sahaja.

Segala kerjasama tuan saya dahului dengan ucapan ribuan terima kasih.

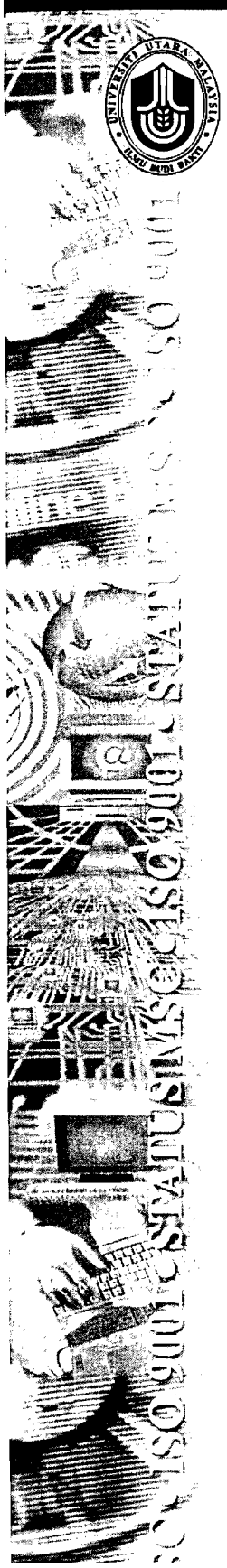
Sekian, harap maklum.

"ILMU BUDI BAKTI"

Saya yang menjalankan tugas

(PROF. MADYA DR. WAN ROZAINI SHEIK OSMAN)
Pengarah dan Profesor Madya
ITU-UUM Asia Pacific Centre of Excellence
Convention Complex
Universiti Utara Malaysia,
06010 UUM Sintok,
Kedah Darul Aman

MSC MALAYSIA Status Institution



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'KEDAH SEJAHTERA'

UUM/PUSAT BAHASA/T-9/2

14 December 2011

Malek Ahmad Theeb Almomani (809678)
Mcs in Information Technology
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Dear Sir

EDITING AND TRANSLATION SERVICE

With reference to the above matter, I would like confirm that **Malek Ahmad Theeb Almomani (809678)** has already completed his editing and translation at Language Center.

Title	**Game-Based Learning Courseware for Pre-School Children To Learn Healthy Eating**
Type of Document	**Master Thesis (Questionnair)**
Total of Words	**964 words**
Services	**Editing (818words) and Translation (149 words)**

Thank you for using our service and we hope to offer you such services in future.

"SCHOLARSHIP,VIRTUE AND SERVICE"

Sincerely

DR SITI JAMILAH BIDIN
Director

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